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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/749,309	12/27/2000	Jeffrey C. Buchholz	728	6126

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Donald J. Ersler
725 Garvens Avenue
Brookfield, WI 53005

EXAMINER	
BELLO, AGUSTIN	
ART UNIT	**PAPER NUMBER**
2633	5

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/749,309	BUCHHOLZ, JEFFREY C.	
	Examiner	Art Unit	
	Agustin Bello	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 April 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edelman (U.S. Patent No. 4,503,564) (hereafter Edelman '564) in view of Edelman (U.S. Patent No. 4,334,321) (hereafter Edelman '321).

Regarding claims 1 and 8, Edelman '564 teaches an optically actuated transducer system comprising: a light emitter (column 2 line 53); a light emitter driver circuit (inherent) receiving an audio signal, said light emitter driver circuit modulating current (column 2 lines 49-50) to said light emitter; a speaker membrane (reference numeral 20 in Figure 3); an absorber layer (reference numeral 29 in Figure 3) being applied to said speaker membrane; and an optical delivery device (reference numeral 26 in Figure 3) receiving light from said light emitter on one end, the other end of said optical delivery device contacting said absorber layer, said absorber layer converting the light to heat (column 2 lines 36-39), the absorber layer experiencing a thermal expansion (column 2 lines 36-39), the thermal expansion causing the speaker membrane to make linear motion and produce an acoustic output (e.g. "Audio" in Figure 3). Edelman '564 differs from the claimed invention in that Edelman '564 fails to specifically teach that the other end of said optical delivery device is in physical contact with said absorbing layer. However, Edelman '321 teaches that it is well known in the art to allow an end of an optical delivery

device to physically contact a speaker membrane of the transducer system (see Figures 2 and 3). One skilled in the art would have been motivated to extend the end of the optical delivery device in Edelman '564 to physically contact the absorber layer of the transducer system in order to increase the light coupling efficiency of the light exiting from the end of the optical delivery device. One skilled in the art would clearly have recognized that the improvement in light coupling efficiency provided by Edelman '321 would come as a result of light exiting from the end of the optical delivery device and being directly coupled to a particular spot of the absorbing layer, thereby reducing the possibility of destructive interference in the unguided light environment of Edelman '564. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to extend the end of the optical delivery device in Edelman '564 to physically contact the absorber layer of the speaker membrane in Edelman '564 according to Edelman '321's disclosure of an optical delivery device in physical contact with a speaker membrane in order to increase light coupling efficiency in Edelman '564.

Regarding claims 2 and 9, Edelman teaches the optically actuated transducer system of claim 1, wherein: said optical delivery device being positioned such that the angle between a face of said speaker membrane and said optical delivery device is substantially perpendicular (as seen in Figure 3).

Regarding claim 3, Edelman teaches the optically actuated transducer system of claim 2, wherein: said optical delivery device being a fiber optic cable (column 2 line 45).

Regarding claims 4 and 10, Edelman teaches the optically actuated transducer system of claim 1, further comprising: a periphery of said speaker membrane being attached to a mounting ring (reference numeral 14, 22 in Figure 1), said mounting ring being attached to a transducer

compartment (reference numeral 23, 24 in Figure 1), said transducer compartment retaining said optical delivery device (reference numeral 28 in Figure 1).

Regarding claims 5 and 11, Edelman teaches the optically actuated transducer system of claim 1, wherein: said speaker membrane being fabricated from a polymer plastic (column 3 lines 2-3).

Regarding claims 6, 7, 12, and 13, Edelman teaches the optically actuated transducer system of claim 1, but differs from the claimed invention in that Edelman fails to specifically teach that the absorber layer is fabricated from a nickel foil or gallium arsenide. However, Edelman teaches that the absorber layer can be fabricated from metals, metal alloys, glasses, or composites (column 3 lines 6-7). One skilled in the art would clearly have recognized that nickel foil, a metal, or gallium arsenide, a glass, could have been used to form the absorber layer of Edelman. One skilled in the art would have been motivated to use either nickel foil or gallium arsenide to form the absorber layer of Edelman since both materials are readily available and each provide unique degrees of absorption. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to fabricate the absorber layer from nickel foil or gallium arsenide.

3. Claims 14-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edelman '564 in view Fulenwider (U.S. Patent No. 4,016,556).

Regarding claim 14, Edelman teaches an optically actuated transducer system comprising: a light emitter (column 2 line 53); a light emitter driver circuit (inherent) receiving an audio signal, said light emitter driver circuit modulating current (column 2 lines 49-50) to said light emitter; a speaker membrane (reference numeral 20 in Figure 3); an absorber layer

(reference numeral 29 in Figure 3) being applied to said speaker membrane; an optical delivery device (reference numeral 26 in Figure 3) receiving light from said light emitter on one end; said absorber layer converting the light to heat (column 2 lines 36-39), the absorber layer experiencing a thermal expansion (column 2 lines 36-39), the thermal expansion causing the speaker membrane to make linear motion and produce an acoustic output (e.g. "Audio" in Figure 3). Edelman differs from the claimed invention in that Edelman fails to specifically teach and an optical beam steering system receiving light on one surface from said optical delivery device and reflecting said light at a different angle, another surface of said optical beam steering device being in physical contact with said absorber layer of the diaphragm. However, such beam steering devices are well known in the art. Fulenwider, in the same field of endeavor, discloses an optical beam steering system receiving light on one surface (reference numeral 38 in Figure 2) from said optical delivery device and reflecting said light at a different angle (as seen in Figure 2), another surface of said optical beam steering device being in physical contact with the diaphragm (column 3 lines 29-32). One skilled in the art would clearly have recognized from the disclosure of Fulenwider that it would have been possible to reflect a light beam from a reflecting surface onto the absorption layer of Edelman while also allowing the another surface of the beam steering device be in physical contact with the absorber layer. One skilled in the art would have been motivated to modify the teachings of Edelman according to the disclosure of Fulenwider in order to create a more compact optically actuated transducer since the configuration disclosed by Fulenwider would have allowed the fiber of Edelman to couple to the absorbing layer of Edelman in a parallel manner. Therefore, it would have been obvious to one

skilled in the art at the time the invention was made to modify the device of Edelman according to the disclosure of Fulenwider.

Regarding claim 15, although the combination of references fails to specifically teach ball lenses, a prism reflector and the effects they provide on light, such devices and their functions are very common in the art and would have been obvious to one skilled in the art at the time the invention was made.

Regarding claim 16, the combination of references suggests that said optical delivery device (reference numeral 26 in Figure 3 of Edelman) could be positioned such that the angle between a face of said speaker membrane (reference numeral 20 in Figure 3 of Edelman and reference numeral 36 in Figure 2 of Fulenwider) and said optical delivery device is substantially parallel (as suggested by Fulenwider in Figure 2).

Regarding claim 17, Edelman teaches said optical delivery device being a fiber optic cable (column 2 line 45).

Regarding claim 18, Edelman teaches a periphery of said speaker membrane being attached to a mounting ring (reference numeral 14, 22 in Figure 1), said mounting ring being attached to a transducer compartment (reference numeral 23, 24 in Figure 1), said transducer compartment retaining said optical delivery device (reference numeral 28 in Figure 1).

Regarding claim 19, Edelman teaches the optically actuated transducer system of claim 1, wherein: said speaker membrane being fabricated from a polymer plastic (column 3 lines 2-3).

Regarding claims 20 and 21, the combination of references differs from the claimed invention in that it fails to specifically teach that the absorber layer is fabricated from a nickel foil or gallium arsenide. However, Edelman teaches that the absorber layer can be fabricated

from metals, metal alloys, glasses, or composites (column 3 lines 6-7). One skilled in the art would clearly have recognized that nickel foil, a metal, or gallium arsenide, a glass, could have been used to form the absorber layer of Edelman. One skilled in the art would have been motivated to use either nickel foil or gallium arsenide to form the absorber layer of Edelman since both materials are readily available and each provide unique degrees of absorption. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to fabricate the absorber layer from nickel foil or gallium arsenide.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Feldman and Edelman teach relevant art.

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (703)308-1393. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703)305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

AB

JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600